

WHAT WE CLAIM IS:

1. A transmission type illumination device for stereomicroscopes, at least comprising, in order from a light source, a collector lens, a diffuser and a convex  
5 lens, wherein an optical element having a periodical structure in a one-dimensional direction is located in the vicinity of a lens located nearest to a viewing surface side.

2. The transmission type illumination device  
10 according to claim 1, wherein the optical element having a periodical structure in a one-dimensional direction satisfies the following condition (1) with respect to an angle  $\alpha$  for splitting a light beam incident on the optical element:

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$$0.5D/L < \tan\alpha < 0.9D/L \quad \dots (1)$$

where D is a effective diameter of a secondary light source, and L is a distance from the optical element having a periodical structure in a one-dimensional direction to the secondary light source.

20 3. A stereomicroscope incorporating a transmission type illumination system at least comprising in order from a light source a collector lens and a diffuser, which comprises a transmission type illumination device wherein an angular aperture for illumination of an  
25 object under observation fully satisfies a pupil of a viewing optical system, wherein said angular aperture has an aspect ratio of 1:1.2 to 1:2.